

NEW CICADAS FROM THE WESTERN UNITED
STATES WITH NOTES ON SEVERAL
OTHER SPECIES

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It appears likely that the cicadas from Nova Scotia to Florida on the Atlantic coast, and for some distance inland, are fairly well known; that is, it seems probable that about all of the species are known. As regards distribution, habits and life cycles, there is of course very much to learn. The cicadas of the eastern states embrace many large species of *Tibicen*, and this condition exists until the neighborhood of that interesting line, the one hundredth meridian, is reached, when the smaller species belonging to the genera *Okanagana*, *Clidophleps* and *Platypedia* become quite numerous, and *Tibicen* is represented only to a slight extent. It is among these genera in the Pacific states, and those immediately adjoining to the eastward, that new forms are most often met with, and as many of the species evidently have but a small distribution, it will probably be some time before they are as well known as those of the Atlantic coast that generally have a wider distribution.

While in the Seventeen-Year and Thirteen-Year cicadas, the periods of the various broods are known and attract attention, it is equally true that there are cicada years among the other species as well, though not so pronounced. A conspicuous example of this kind, to which the writer can testify, was the year 1921 at Wingina, Nelson County, Virginia, when in August cicadas of several species, such as *winnemanna*, *auletes* and *lyricen* would join at evening in a continuous chorus in the trees about the house. August, 1927, was a great contrast; there was no evening chorus and a cicada of any kind was a rarity. In August, 1921, Colonel Robinson collected thirty-six *Tibicen robinsoniana* with the shotgun, while in 1927 the gun was not once taken afield, for the cicadas were not to be seen. Even the usual common *Tibicen*

chloromera was scarce. It would seem from this and other like experiences, that a number of our larger cicadas appear together, that their life periods are of the same duration, and that we in consequence have cicada years. There is some advantage to a species, or several allied species, to appear together, and give their mutual enemies some starvation years in between. It appeared that the Cicada Killer, the hornet *Specius speciosus*, that requires but a year for its life cycle, made out but poorly at Wingingina in 1927; we saw but few and found none of their burrows in a search of three weeks.

In the following notes the fact is mentioned that some of the species of *Okanagana* and *Platypedia* may also appear as broods. In the U. S. Department of Agriculture, Bureau of Entomology, Bulletin No. 71, on the Periodical Cicada, Dr. C. L. Marlatt states: "The writer recalls that in the summer of 1885 a very large species of Cicada (*C. marginata* Say) appeared in considerable numbers among the scrubby white oaks bordering a stream near Manhattan, Kans., and filled the air with its very loud and discordant vibrations; yet, although familiar with and a frequent visitor of these woods in earlier and later years, no other experience with this particular species was had. It may be, therefore, that this species, which is more than twice the size of the periodical Cicada, has an even longer life period. There are other western or Rocky Mountain species which give evidence of paralleling very closely in periodicity and number the eastern periodical Cicada."

Tibicen tigrina new species. Pl. XVII, Figs. 1 and 5.

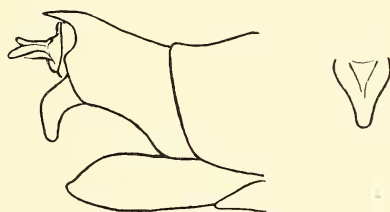
Type male from New Braunfels, Comal Co., Texas, July 11, 1926, and allotype from the same place, July, 1922 (Otto M. Locke, Jr.). Davis collection.

Resembles *Cicada montezuma* Distant, described and figured in *Biologia Centrali-Americana* from Mexico.

Head across eyes broader than the anterior width of the pronotum, front moderately produced with the median sulcus but faintly represented; transverse rugae well defined by the silvery hairs in the grooves. Many silvery hairs on the face and some in the depressions of the dorsal surface and on the abdominal segments. Beneath pruinose with many hairs on the legs. The short opercula meet along the inner margins and are rather evenly rounded at the extremities. The last ventral segment is rounded and feebly

notched at the extremity. Uncus bent as shown in the illustration. Sides of the body in the male parallel for a considerable distance, somewhat less so in the female. The last ventral segment of the allotype has a shallow notch with a spot each side.

General color buff and black, resembling in this respect the much larger *Tibicen rudis* of Mexico, but it differs from that species in having less pointed wings and a very differently shaped uncus. (See Bio. Centr.-Am. Homoptera, Tab. 2, Fig. 20.) Head black with six buff spots; one on the front, one just behind it, one over each antenna and one near each eye posteriorly. Pronotum greenish buff, the collar black anteriorly for about half of its width, the black extending along the sides to the anterior angles; grooves black. The mesonotum is more black than buff, with a central pale W-shaped mark about the two obconical black spots at the anterior margin. The cruciform elevation or X is pale, with a black spot centrally, and two oblong pale spots each side near the wings, the anterior one much the larger. Abdomen black above, the first segment broadly and irregularly margined with buff, and all of the other segments margined or striped posteriorly with buff usually to about one third of their area. Underside of the body straw-colored, narrowly black near the eyes, and the legs variegated with black, especially at the joints and the tarsal claws. Fore wings with a dark stripe or spot about 2 millimeters in length contained in the basal area and extending about two thirds of the way through its central part toward the base of the wing; venation pale, darker about the marginal cells; first and second cross veins clouded. The basal membranes of both pairs of wings are pale gray in color.



TIBICEN TIGRINA TYPE

MEASUREMENTS IN MILLIMETERS

	Male Type	Female Allotype
Length of body	26	28
Width of head across eyes	11	11.5
Expanse of fore wings	78	84
Greatest width of fore wing	12	13
Greatest width of operculum	5.5	
Greatest length of operculum	6	

In addition to the type and allotype there are twenty-two male and ten female paratypes in the writer's collection, all from New Braunfels and collected in July, August and September. The Cornell University expedition of 1917 collected a male at Anhalt, Comal Co., Texas, June 28, and a male and female at Juno, Texas, July 3. Dr. H. H. Knight also collected a male at Comstock, Texas, July 3, 1917. In the collection of the U. S. National Museum there are specimens from Texas as follows: Gatesville, July 16, 1888, and Kerrville, June 19, 1907 (F. C. Pratt). In this Journal for June, 1926, five males and two females doubtfully identified as *Tibicen montezuma* are recorded from Arbuckle Mountains, Oklahoma, July, 1925, collected by Mr. Raymond H. Beamer, who described the song as shrill and loud and the insect hard to locate and wild.

In the Transactions of the Maryland Academy of Sciences for 1892, p. 154, Uhler states that *montezuma* Distant occurs in Mexico, California, Arizona, New Mexico and Texas. The writer now has two males from Mexico, one from Cuernavaca, received through the kindness of Prof. Alfonso L. Herrera, that more closely resemble the figure in Bio. Centr.-Am. and are distinct from *tigrina*. One of the Mexican specimens has been compared in the British Museum by Mr. W. E. China.

Tibicen inauditus Davis.

This species resembles *tigrina*, but is much smaller and darker colored. It was described from Oldham County, Texas, and has been recorded from New Mexico. In 1926 Mr. O. C. Poling collected one female and three males in June and July at Sunny Glen Ranch, near Alpine, Brewster County, Texas. On June 7, 1927, Mr. George P. Engelhardt also collected a male at Alpine, Texas. In Cimarron County, Oklahoma, three miles north of Kenton, a female was collected by Prof. T. H. Hubbell, July 2, 1926. These specimens are in the writer's collection. Another female, in the collection of the University of Michigan, was collected at Kenton, July 6, 1926 (T. H. Hubbell).

Cacama crepitans Van Duzee.

On the 23d of July, 1924, Mr. R. P. Dow collected three males and one female of this species at San Juan Capistrano, Orange

Co., California, and on June 26, 1927, Mr. Alonzo C. Davis collected eight males at the same place. On June 18, 1927, Mr. Davis also collected a female at Newport, Calif. These localities extend northward, the recorded range for this species. On the 4th of June, 1922, Mr. Howard H. Cleaves captured by hand two males on Broncho grass near San Diego, Calif., and wrote that the song was high pitched.

Cacama carbonaria Davis. Pl. XVII, Fig. 2.

In the collection of the U. S. National Museum there is a male from Puente de Ixtla, Morelos (C. C. Deam). This place is about 150 miles south of Mexico City, the type locality. The uncus has been compared with that of the type described and figured in this JOURNAL, March, 1919. The U. S. National Museum specimen expands 70 millimeters and is here figured. It is somewhat smaller than the type, which was heretofore the only recorded specimen.

Okanagana gibbera new species. Pl. XVII, Figs. 3 and 6.

Type male and allotype female from Iron Springs, Iron Co., Utah, June 26, 1919 (T. Spalding). Davis collection.

This beautifully colored orange and black species resembles *Okanagana fratercula*, of the same region, but it is larger, with broader wings and the humped condition of the back at segments seven and eight is much more pronounced.

Head narrower than the front margin of the pronotum; front considerably produced and prominent. Median sulcus of the front well defined with the sides nearly parallel. Pronotum with the humeral angles rounded, the anterior angles prominent and the sides slightly wavy and uneven. Last ventral segment with the sides converging toward the extremity, which is shallowly notched, or in some of the paratypes almost truncate. Uncus black, and when viewed in profile with the top and lower lines nearly parallel until the extremity is approached. When viewed from behind, with a shallow notch at the extremity. The valve in the males extends slightly beyond the uncus; is pale orange, blackened beneath at the base. The last ventral segment of the allotype is deeply notched with a very slight indication of an inner notch. Fore wings broad with the costal margin bright orange almost to the end of the wings, where it is slightly darkened; basal cell opaque with surrounding vein bright orange. The venation is bright orange nearly to the row of marginal cells, where it is almost black, a noticeable feature of the species on account of the contrasting colors. The bases

of both pairs of wings, as well as the membranes, are orange margined with black or fuscous. Head black with the front at the top of the median sulcus, a spot above each antenna and a line almost connecting these spots, pale. In some of the paratypes the head is entirely black except for the spots above the antennæ. Pronotum black with the hind margin or collar and about one half of the lateral margin at the anterior angles, orange. Some of the paratypes have the anterior margin very narrowly orange. There is a central pale line extending back to the collar, absent in some of the paratypes. Mesonotum black with the posterior margin, two central spots at the anterior extremities of the elevated X, and a spot each side at the base of the hind wings, orange. Metanotum margined posteriorly with orange. Tergum black with segments 7, 8 and 9 margined posteriorly with orange. Beneath the legs are marked with orange and black with the posterior surfaces orange.

MEASUREMENTS IN MILLIMETERS

	Male Type	Female Allotype
Length of body	27	25
Width of head across eyes	7	7
Expanse of fore wings	66	65
Greatest width of fore wing	12	12
Length of valve	5	



OKANAGANA GIBBERA TYPE

In addition to the type and allotype, the following specimens are in the writer's collection: Two males and fifteen females collected at the same time and place as the types, by Mr. Tom Spalding and Mr. Warren Knaus; male, Coal Creek, Iron Co., Utah, June 27, 1919 (T. Spalding); two males, Reno, Nevada, June 6, 1909 (Dr. E. D. Ball); male, Burns, Oregon, June 1, from Oregon Agricultural College. Additional specimens have

been examined as follows: Yakima City, Washington, July 2, 3, 4, 1882, female; Ft. Laramie, three females, and Bridger Basin, Wyoming, four males and a female, all in collection Museum of Comparative Zoology, Cambridge, Mass. Laramie, Wyoming, male (Dr. B. H. Grave), and White River, Colorado, August 6, 1877, male (Miss E. H. Danforth), in collection U. S. National Museum.

The very much humped back, especially in the female, together with the broad wings and bright, contrasting colors, will serve to separate this species, which was mentioned but not named, in this JOURNAL for 1919, p. 209.

Okanagana fratercula Davis. Plate XVIII, Fig. 1.

This species was described in this JOURNAL for March, 1915, from a single male taken in Iron County, Utah. Other examples are mentioned in the 1919 volume, page 209. Since that date many more have been examined from Idaho, Wyoming, Nevada and Utah, collected in May, June and July. A series of six males were collected July 3, 1925, at Cypress Hills, Alberta, by Mr. F. S. Carr, inspector of schools at that place. Dr. J. W. Sugden sent two males and two females collected June 9, 1925, at Red Canyon, near Bryce Canyon, Southern Utah. Three males have been examined in the collection of the U. S. National Museum from Blackfoot, Idaho, June 22, 1904 (E. S. G. Titus). Mr. R. W. Haegele sent through Mr. M. C. Lane, six males and eight females collected at Rogerson, Idaho, May 20, 1926, and wrote of the insects as follows: "They were collected from sage brush twenty miles west from Rogerson on a rolling plateau area that covers a large part of southwestern Idaho, and at an altitude of from 5,000 to 6,000 feet. They were collected on a cool, cloudy day and were not at all active, many being freshly emerged so that I could pick them from the sage at will. There were literally thousands of them and I picked as many as fifty from one ordinary sage bush less than four feet high and about three feet across. The ground was punctured full of holes where they had come through and the sage brush was full of empty pupal cases. They were noted from this point to about twenty-

five miles north in considerable abundance. At a somewhat later date they were noticed at different points in Southern Idaho and in the desert region of Eastern Oregon.”

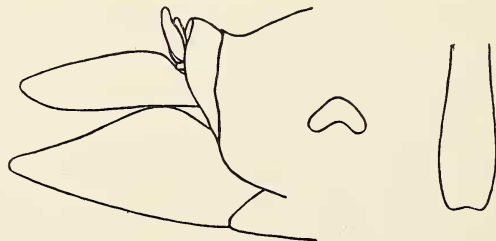
It is evident that there was a brood of this species in 1926, as described by Mr. Haegele, and if the same locality could be watched an additional life cycle to that of the seventeen-year cicada might be ascertained.

Okanagana schaefferi, *O. gibbera* and *O. fratercula* all inhabit Utah and resemble one another. Usually the pronotum in both *schaefferi* and *fratercula* is bordered all around with pale, whereas in *gibbera* the orange border is broken at or near the hind angles. In *schaefferi* and *fratercula* the hind margin of each abdominal segment is usually some shade of red, while in *gibbera* only the three last segments are margined with orange. The front of the small head is very prominent in *schaefferi* and *gibbera*; in *fratercula* it is less so.

In order to facilitate more ready comparison the original figures of *schaefferi* and *fratercula* from this JOURNAL of March, 1915, are reproduced on the accompanying plate. *Okanagana fratercula* may be larger than the figure and attain an expanse of wings of sixty millimeters.

Okanagana opacipennis Davis. Pl. XVIII, Fig. 2.

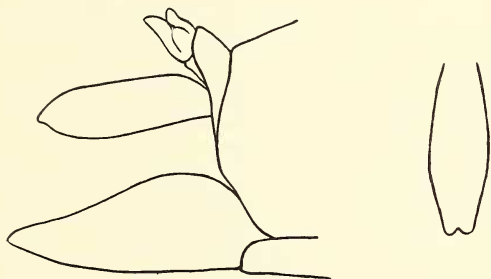
This insect was described and figured in the June, 1926, number of this JOURNAL, from a female taken at Buckman Springs, San Diego Co., California, June 23, 1925 (Prof. W. S. Wright), as a variety of *Okanagana arctostaphylæ* Van Duzee. Prof. Wright on June 26, 1926, collected a male *opacipennis* at the same locality, and as in the first instance on manzanita. A figure



OKANAGANA OPACIPENNIS DAVIS

of the uncus is here presented; also one of the uncus of *arctostaphylæ*. The differences thus shown, taken together with color differences, would indicate that *opacipennis* should be considered as distinct from *arctostaphylæ*.

The male of *opacipennis* is like the female type except that it is not quite so brilliantly colored. The red on the head and pronotum has a greenish tinge, as have the veins of both pair of wings. The abdomen is black dorsally, except the last two segments, which are pale, the penultimate one having a dorsal black spot. In the type, the under side of the abdomen is red, each segment having a black spot on each side, leaving the central part of the abdomen an even color, except for the basal black spot on segment one found in many *Okanagana*. Legs in both the male and female entirely red in color, narrowly blackened at the joints. The uncus and valve are shaped as figured. The former has a pale dorsal stripe, blackened at the sides; the latter is entirely pale green. The under side of the abdomen in the male is pale, in part greenish, especially near the end, while the usual black spot is at the base of the first segment. The measurements in millimeters are as follows: Length of body, 26; width of head across eyes, 7; expanse of fore wings, 65; greatest width of fore wing, 10; length of valve, 4.



OKANAGANA ARCTOSTAPHYLÆ VAN DUSEE

Tibicinoides minuta Davis. Plate XVIII, Fig. 6.

Numerous examples of this very small-headed species, with the marginal areas to the wings shorter than in *Okanagana*, have been examined since it was described in this JOURNAL for March, 1915. Mr. F. E. Winters has collected many on a hillside within

the city limits of Santa Barbara, Calif., some of them on tarweed. Thirty-four specimens were found in April, May and June, the majority in May, 1926, when they were quite common. While in most the color at the base of the wings is bright orange, it is more red in a few examples. Other specimens are as follows: Coalinga, Fresno Co., Calif., June, 1907, three males (Prof. Bradley), collection Cornell University; Mt. Hamilton, Santa Clara Co., June 20, 1922, three males (F. H. Wymore); Lebec, Kern Co., Calif., June 1, 1918, three males (A. C. Davis), and Ft. Tejon, Calif., May 29, 1927, two males (A. C. Davis).

The original figures of the types of *Tibicinoides minuta* and the closely allied *Tibicinoides mercedita*, from this JOURNAL of March, 1915, are here reproduced for comparison.

Clidophleps vagans Davis. Pl. XVIII, Fig. 3.

The specimen figured was received for examination from the British Museum through the courtesy of Mr. W. E. China and is the second example known. It is a male and labeled Yosemite, Tioga Pass, July 17, 1922 (C. B. Pearson). The type described and figured in this JOURNAL, March, 1925, was found in an automobile after an extended journey, so the exact locality could not be given.

Clidophleps tenuis new species. Pl. XVIII, Fig. 4.

Type male from La Puerta Valley, San Diego Co., California, May 29, 1927, and allotype collected at the same time and place by Mr. J. C. von Bloeker.

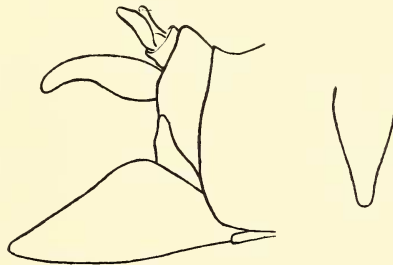
Head as broad as the front margin of the pronotum; front produced about as in *blaisdelli* and *pallida*. Median sulcus of the front shallow, sides not parallel and broadest near its central portion. In the allotype the sides of the groove are more nearly parallel. Pronotum with humeral angles rounded; the anterior angles prominent. Last ventral segment somewhat constricted at the sides near the central portion and the extremity but slightly truncate. Uncus when viewed in profile bent downward at the extremity and sinuate on the lower part of the apical half; slightly shorter than the valve, but more nearly its length than in any *Clidophleps* with the exception of *vagans*. Last ventral segment of the allotype broadly and doubly notched. Basal cell of the fore wings clear. Costal margin of the fore wings black; subcostal vein greenish; radial vein black; remaining veins almost entirely black; anal vein and part of the attenuated nodus

pale. Membranes at base of all of the wings pale salmon color and not quite so dark as in *pallida*.

General body color black, variegated with greenish yellow. Head shining black, a pale spot above each antenna, and three spots at the back of the head behind the ocelli, the central one being the largest. Beneath, the head is black, pale each side of the transverse rugæ; the median sulcus is centrally black, the edges paler. Pronotum with a large rufus area margined with black on each side of the pale central line, which line extends back to the posterior margin of the collar, also pale in color. Mesonotum black, margined at the sides and posteriorly with pale. Two pale J-shaped marks, placed centrally and rather close together, extending backward toward the elevated X, which is pale at its central portion, with the fore limbs crossed by black, and then two pale torch-like marks extending toward the anterior margin. The last mentioned marks are more attenuated than the similar ones in *pallida*, *distanti* or *blaisdelli*, and more closely resemble those of *astigma*. Metanotum pale with a curved black spot near the base of each wing. Dorsum of the abdomen shining black, each segment margined posteriorly with greenish yellow. The uncus black above, slightly pale toward the extremity, and the valve pale. The abdomen is pale beneath; the legs pale with the femora, tibæ and tarsi black on the outer surfaces.

MEASUREMENTS IN MILLIMETERS

	Male Type	Female Allotype
Length of body	26.5	23
Width of head across eyes	8	7
Expanse of fore wings	64	64
Greatest width of fore wings	10	10
Length of valve	4	



CLINOPHLEPS TENUIS TYPE

In addition to the type and allotype Mr. von Bloeker collected three males and four females at the same place and time, describing the conditions as desert in character.

This species resembles *Clidophleps pallida*, but the fore wings are narrower and lie flatter; that is, are not so much bulged up centrally when they are expanded. In these respects it approaches *C. vagans*, but differs from it in having the nodus at the outer end of the cubital cell much broader and the cubitus vein more arched, as will be seen by comparing the figures presented. In *C. tenuis* the J-shaped marks on the mesonotum are more parallel than in the other known species of the genus. *Clidophleps astigma* figured in this JOURNAL for March, 1917, has the front of the head broad and prominent. Figure one of the same plate is there identified as *C. blaisdelli* Uhler, but in 1926 this form was described as *C. wrighti*, after Uhler's types in the U. S. National Museum had been examined.

Platypedia putnami Uhler.

The typical form of this species has been recorded from Colorado, Nebraska, Nevada, New Mexico and California, but its known distribution may be extended to Arizona. Mr. D. K. Duncan has sent a male and three females collected at Diamond Creek, White Mountains, June 6, 1925, and Mr. George P. Engelhardt has given me a male collected in the Sierra Ancha Mountains, June 15, 1927. Variety *lutea*, with the colors orange and black instead of red and black, seems to be more common in Arizona.

Platypedia barbata Davis.

Santa Barbara, Calif., May, 1926, male (F. E. Winters). The male type and female allotype were from San Louis Obispo, California, and were collected in April. The male from Mr. Winters is the only additional specimen so far recorded. Santa Barbara is about eighty miles southeast of the type locality and in the adjoining county.

Neoplatypedia ampliata Van Duzee.

In the collection of the British Museum there is a male labeled "*C. californica* Fitch Ms. California." This manuscript name has of course no standing. The specimen has the uncus turned

upward at the extremity, which is not constricted, but is as figured in this JOURNAL, June, 1920, and the membranes at the base of both fore and hind wings are almost white instead of orange, as in *constricta*.

***Neoplatypedia constricta* Davis.**

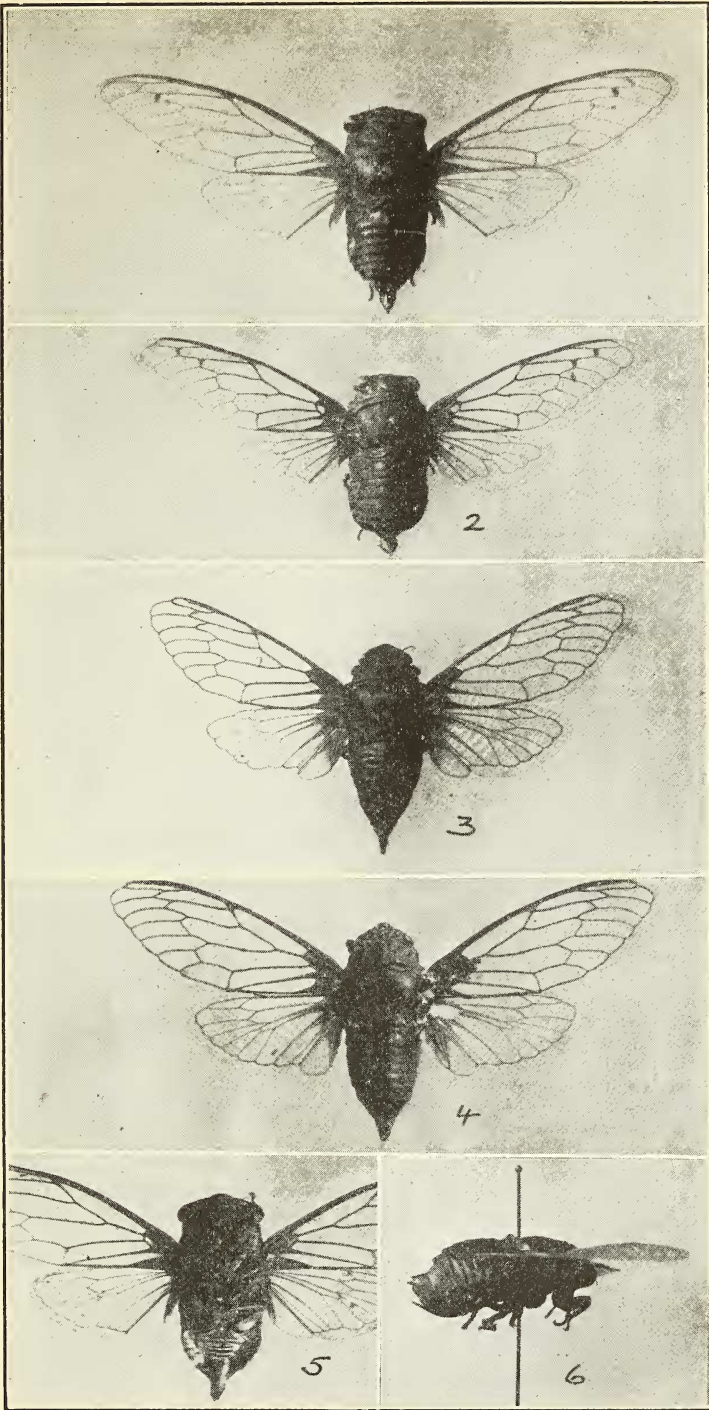
This species was reported from Arizona, Utah, Colorado, and California when originally described. To this distribution may now be added Pocatello, Idaho, May 23, 1889, two males and a female, collection Iowa State College of Agriculture, and Bliss, Twin Falls Co., Idaho, May 25, 1927, five males and two females (R. W. Haegele). Mr. Haegele noted that they were "collected from sage in desert and were rather numerous."

***Melampsalta kansa* Davis.**

In the collection of the U. S. National Museum there are Texas specimens of this species from a number of localities, among them a female labeled "Cuero, Tex., 5-3-96, Marlatt," and also "Insect Book, Pl. 28, Fig. 8," where it is identified as *Melampsalta parvula*.

PLATE XVII

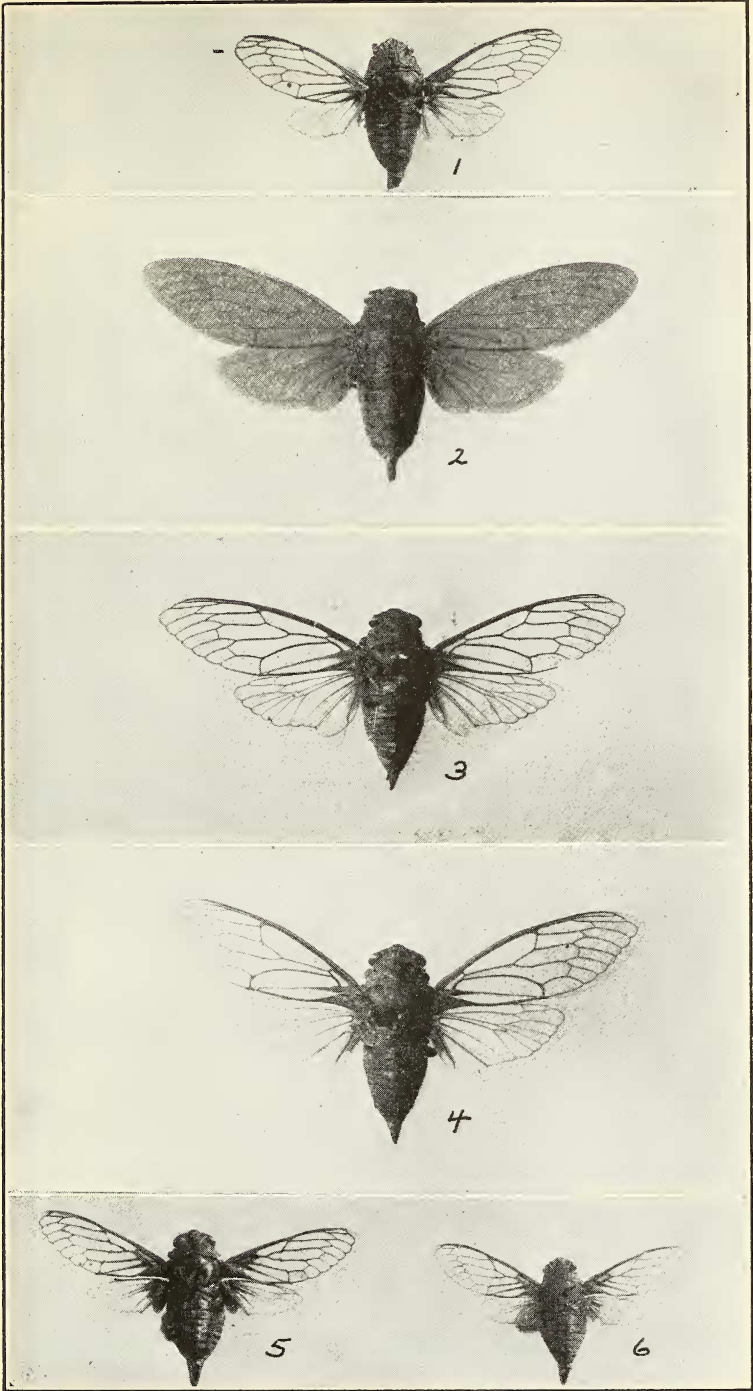
- FIG. 1. *Tibicen tigrina*. Type.
FIG. 2. *Cacama carbonaria*.
FIG. 3. *Okanagana gibbera*. Type.
FIG. 4. *Okanagana schaefferi*. Type figure reproduced.
FIG. 5. *Tibicen tigrina*. Showing opercula.
FIG. 6. *Okanagana gibbera*. Showing back of female.



CICADIDÆ

PLATE XVIII

- FIG. 1. *Okanagana fratercula*. Type figure reproduced.
FIG. 2. *Okanagana opacipennis*.
FIG. 3. *Clidophleps vagans*.
FIG. 4. *Clidophleps tenuis*. Type.
FIG. 5. *Tibicinoides mercedita*. Type figure reproduced.
FIG. 6. *Tibicinoides minuta*. Type figure reproduced.



CICADIDÆ